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Rejections Under 35 USC §102 and §103

Claims 34, 38-39, 43, 49 and 51 have been finally rejected under 35 USC §102(b) as being anticipated by Fjelstad et al (US Patent No. 5,632,631).

Claims 35, 40-41 and 50 have been finally rejected under 35 USC §103(a) as being unpatentable over Fjelstad et al. (US Patent No. 5,632,631) in view of Kazle (US Patent No. 5,936,847).

In response to the rejections under 35 USC §102 and 35 USC §103, the claims have been amended.

A reading of the amended claims on the drawings and specification is as follow.

34. A method for fabricating an interconnect **(10-Figure 1, page 9, lines 6-30)** for electrically engaging a bumped contact **(16-Figure 2C page 9, lines 6-30)** on a semiconductor component **(18-Figure 2C page 9, lines 6-30)** comprising:

providing a substrate **(14B-Figure 7A, page 18, line 33 to page 19, line 3)** having a surface **(26B-Figure 3C)**;

forming a plurality of leads **(22B-Figure 7C, page 19, lines 10-14)** on the surface **(26B-Figure 3C)** configured to electrically engage and support the bumped contact **(Figure 3B, page 4, lines 18-21)**, the leads having terminal portions **(30A-Figure 2B, page 10, line 33)** and support portions **(32A-Figure 2A, page 11, lines 1-3)**;

etching a recess **(20B-Figure 7F, page 21, lines 10-14)** in the surface configured to cantilever the terminal portions over the recess with the support portions on the surface supporting the terminal portions **(page 11, lines 3-5)** for movement within the recess during electrical engagement of the bumped contact **(page 12, lines 2-5)**.

35. The method of claim 34 further comprising forming outer layers **(46B-Figure 7B and 3D, page 19, lines 4-9 of the sp cification)** on the terminal portions configured to provide a non bonding surface for the bumped contact.

38. The method of claim 34 wherein the substrate comprises a semiconductor material **(page 10, line 4)** and the etching step comprises anisotropic etching **(page 16, line 30)**.

39. A method for fabricating an interconnect **(10-Figure 1, page 9, lines 6-30)** for electrically engaging a bumped contact **(16-Figure 2C page 9, lines 6-30)** on a semiconductor component **(18-Figure 2C page 9, lines 6-30)** comprising:

providing a substrate **(14B-Figure 7A, page 18, line 33 to page 19, line 3)** having a surface **(26B-Figure 3C)**;

forming a metal layer **(leads 22B-Figure 7C, page 19, lines 10-14)** on the surface **(26B-Figure 3C)**;

etching **(page 15, lines 26-31)** a plurality of projections **(blades 28B-Figure 7B, page 19, lines 4-5 described as projections on page 4, line 25)** in the metal layer configured to penetrate the bumped contact **(page 12, lines 33-34)**;

forming an outer layer **(46B-Figure 7B and 3D, page 19, lines 4-9)** on the metal layer configured to provide a non-bonding surface for the bumped contact **(page 13, line 27, to page 14, line 2)**;

forming a plurality of leads **(leads 22B-Figure 7C, page 19, lines 10-14)** in the metal layer configured to electrically engage and support the bumped contact **(Figure 3B, page 4, lines 18-21)**, the leads having terminal portions **(30A-Figure 2B, page 10, line 33)** with the projections thereon and support portions **(32A-Figure 2A, page 11, lines 1-3)**;

etching a recess **(20B-Figur 7F, page 21, lines 10-14)** in the surface configured to cantilever the terminal portions over the recess with the support portions on the surface supporting the terminal portions **(page 11, lines 3-5)** for movement within the recess during electrical engagement of the bumped contact **(page 12, lines 2-5)**.

40. The method of claim 39 wherein the outer layer comprises a conductive polymer **(page 14, lines 1-2)**.

41. The method of claim 39 wherein the outer layer comprises a material selected from the group consisting of a carbon film and a metal filled silicone **(page 14, lines 1-2)**.

43. The method of claim 39 further comprising forming a connecting segment **(40B-Figure 7F, page 19, lines 11-14)** on the substrate electrically connecting the leads, a conductive via **(42B-Figure 7E, page 19, line 15 to page 20, line 31)** in the substrate in electrical communication with the connecting segment and a contact **(38B-Figure 7F, page 20, line 32 to page 21, line 9)** on the substrate in electrical communication with the conductive via.

49. A method for fabricating an interconnect **(10-Figure 1, page 9, lines 6-30)** for electrically engaging a bumped contact **(16-Figure 2C page 9, lines 6-30)** on a semiconductor component **(18-Figure 2C page 9, lines 6-30)** comprising: providing a substrate **(14B-Figure 7A, page 18, line 33 to page 19, line 3)**;

forming a plurality of interconnect contacts **(14B-Figure 7G, page 18, line 2 to page 21 line 20)** on the substrate configured to electrically engage the bumped contacts **(page 9, line 26)**, each interconnect contact comprising a plurality of leads **(leads 22B-Figure 7C, page 19, lines 10-14)** having terminal portions **(30A-Figure 2B,**

page 10, line 33) and projections **(blades 28B-Figure 7B, page 19, lines 4-5 described as proj ctions on page 4, lin 25)** on the terminal portions;

etching a plurality of recesses **(20B-Figure 7F, page 21, lines 10-14)** in the substrate proximate to the leads configured to cantilever the terminal portions of the leads for movement within the recesses during the electrical engagement **(page 12, lines 2-5)**; and

forming outer layers **(46B-Figure 7B and 3D, page 19, lines 4-9)** on the terminal portions and projections configured to provide non-bonding surfaces for the bumped contacts **(page 13, line 27, to page 14, line 2)**.

50. The method of claim 49 wherein the outer layers comprises a conductive polymer **(page 14, lines 1-2 of the specification)**.

51. The method of claim 49 wherein the projections comprise blades **(blades 28B-Figure 7B, page 19)**.

Argument

Amended independent claims 34, 39 and 49 recite an "etching" step (Figure 7F) wherein the recess 20B is etched, such that terminal portions (30A-Figure 2B), of the leads 22B are cantilevered for movement within the recess, and are supported by support portions (32A-Figure 2A) attached to the surface of the substrate 14B. The structure and function of the terminal portions (30A-Figure 2B) and the support portions (32A-Figure 2A) is described on page 10, line 32 to page 11, line 5 of the specification.

Fjelstad et al. does not disclose or suggest such a recess etching step for cantilevering and supporting previously formed leads on a substrate. As a proper 35 USC §102 rejection requires that each and every limitation of the claimed invention be disclosed in a single prior art reference, this recitation overcomes the rejections.

In addition to the "recess etching" step, amended independent claim 39 also recites an "etching" step for forming projections (blades 28B) on the leads. This "etching" step is described on page 15, lines 26-31 of the specification. Independent claim 39 also recites the step of "forming an outer layer on the metal layer configured to provide a non bonding surface for the bumped contacts". Fjelstad et al. does not disclose or suggest an etching step for forming projections, in combination with a "forming" step for forming non bonding outer layers on the projections.

Amended independent claim 49 also recites the "recess etching" step in combination with a "forming" step for non bonding outer layers. Fjelstad et al. does not disclose or suggest this combination of steps.

With respect to the 35 USC §103 rejections based on Fjelstad et al. and Kazle, the above arguments are essentially restated. Specifically, Fjelstad et al. does

not disclose or suggest all of the steps and features of the presently claimed method.

Also with respect to the 35 USC §103 rejections, Kazle was cited as teaching conductive polymer layers 140a, 140b. However, in the present case the conductive polymer layers are configured to provide non bonding outer layers on the leads, which do not bond to the bumped contacts on the component. In Kazle the conductive polymer has the opposite structure and function, as it is configured to form a bonding surface to the component contacts. Specifically, the conductive polymer 140a, 140b in Kazle is deposited in a viscous condition by stencil, screen printing or injection (column 4, lines 55-62), and is then cured (column 4, lines 65-67). The cured conductive polymer 140a, 140b would bond to the component contacts 12a, 12b (Figure 3), rather than provide a non bonding surface for component contacts as presently claimed.

Further, the Office Action states that Kazle discloses a conductive polymer which comprises a carbon film. However, Applicant is unable to locate any teaching of a conductive carbon film in Kazle.

Conclusion

In view of the amendments and arguments, the rejections are submitted to have been overcome. Favorable consideration and allowance of claims 34-35, 38-41, 43 and 49-51 is respectfully requested.

An Information Disclosure Statement is being filed concurrently with this Amendment. Should any issues arise that will advance this case to allowance, the Examiner is asked to contact the undersigned by telephone.

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